Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING
AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS
Inventors: Dennis A. Carson, et al.
Application No.: 09/847,102
Docket No.: 220002062900

1/16

FIG. 1

2/16

Alignment of several frizzled family members

↦   amino terminal domain

```
fz3/mouse   -------------------MAVSWIVFDLWLLTVFLG---QIGGHS--------LFSCE.
fz4/mouse   ------MAWPGTGPS---SRGAPGGVGLRLGLLLQFLLLLRPTLGFGD-----EEERRCD
fz8/mouse   ---------MEWGYL-----LEVTSLLAALAVLQRSSG-AAAASAK--------ELACQ
fz5/human   ---------MARPDP-----SAPPSLL--LLLLAQLVG-RAAAASK--------APVCQ
fzd9/human  -----MAVAPLRGALLLWQLLAAGGAALEIGRFD-------PERGRG--------AAPCQ
fzl/rat     LEAPLLLGVRAQPAG---QVSG-PGQQRPPPPQPQQGG--QQYNGERG--ISIPDHGYCQ
fz2/rat     --------MRARSAL---PRSALPRLLLPLLLLPAAGP--AQFHGEKG--ISIPDHGFCQ
fz/Dros     ILPTLIQGVQRYDQS---PLDASPYYRSGGGLMASSG---TELDG------LPHHNRCE
fz2/Dros/   GLVLLLTSCRADGPL-----HSADHGMGGMGMGGHGLD-ASPAPGYGVPAIPKDPNLRCE
                                                               *:
```

                                    CRD

```
fz3/mouse   PITLRMCQDLPYNTTFMPNLLNHYDQQTAALAMEPFHPMVNLDCSRDFRPFLCALYAPIC
fz4/mouse   PIRIAMCQNLGYNVTKMPNLVGHELQTDAELQLTTFTPLIQYGCSSQLQFFLCSVYVPMC
fz8/mouse   EITVPLCKGIGYNYTYMPNQFNHDTQDEAGLEVHQFWPLVEIQCSPDLKFFLCSMYTPIC
fz5/human   EITVPMCRGIGYNLTHMPNQFNHDTQDEAGLEVHQFWPLVEIQCSPDLRFFLCTMYTPIC
fzd9/human  AVEIPMCRGIGYNLTRMPNLLGHTSQGEAAAELAEFAPLVQYGCHSHLRFFLCSLYAPMC
fzl/rat     PISIPLCTDIAYNQTIMPNLLGHTNQEDAGLEVHQFYPLVKVQCSAELKFFLCSMYAPVC
fz2/rat     PISIPLCTDIAYNQTIMPNLLGHTNQEDAGLEVHQFYPLVKVQCSPELRFFLCSMYAPVC
fz/Dros     PITISICKNIPYNMTIMPNLIGHTKQEEAGLEVHQFAPLVKIGCSDDLQLFLCSLYVPVC
fz2/Dros/   EITIPMCRGIGYNMTSFPNEMNHETQDEAGLEVHQFWPLVEIKCSPDLKFFLCSMYTPIC
             : :   *  .:  **   :**  .*  *  *    :   :*::: *     : :**:   *:*
```

                                    CRD

```
fz3/mouse   M-EYGRVTLPCRRLCQRAYSECSKLMEMFG-VPWPEDMECSRFPDCD-EPYPRLVDLN--
fz4/mouse   TEKINIPIGPCGGMCLSVKRRCEPVLREFG-FAWPDTLNCSKFPPQN-DHNHMCMEGP--
fz8/mouse   LEDYKKPLPPCRSVCERAKAGCAPLMRQYG-FAWPDRMRCDRLPEQG-NPDTLCMDYN-R
fz5/human   LPDYHKPLPPCRSVCERAKAGCSPLMRQYG-FAWPERMSCDRLPVLGRDAEVLCMDYN-R
fzd9/human  TDQVSTPIPACRPMCEQARLRCAPIMEQFN-FGWPDSLDCARLPTRN-DPHALCMEAPEN
fzl/rat     T-VLEQALPPCRSLCERA-QGCEALMNKFG-FQWPDTLKCEKFPVHG--AGELCVGQNTS
fz2/rat     T-VLEQAIPPCRSICERARQGCEALMNKFG-FQWPERLRCEHFPRHG--AEQICVGQNHS
fz/Dros     T-ILERPIPPCRSLCESA-RVCEKLMKTYN-FNWPENLECSKFPVHG--GEDLCVAENTT
fz2/Dros/   LEDYHKPLPVCRSVCERARSGCAPIMQQYS-FEWPERMACEHLPLHG-DPDNLCMEQPSY
             *  :*  .   *         **  :  *   :*           :
```

FIG. 2A

Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING
AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS
Inventors: Dennis A. Carson, et al.
Application No.: 09/847,102
Docket No.: 220002062900

3/16

```
fz3/mouse    ------------------------------------------------LVGDPTE----
fz4/mouse    ---GDEE-----------------------------------------VPLPHKTP-
fz8/mouse    TDLTTAAPSPPRRLPPPPPPPGEQPPSGSGHSRPPGARPPHRGGSSRGSGDAAAAPPSRGG
fz5/human    SEATTAPPRP---FPAKP---TLP--G-----PP-------------G----APAS-GG
fzd9/human   ATAGPAEPHK----GLGM----LP------------------------VAPRPARPPG
fzl/rat      DKGTPTPSL------------L--------------------------PEFWTSNPQHG
fz2/rat      EDG--TPAL------------L--------------------------TTAPPSGLQPG
fz/Dros      SSA---------------------------------------------STAATPTRSVA
fz2/Dros/    TEAGSGGSSG----GSGG---SGSGSGSGGKRKQGGSGSGGSGAGGSSGSTSTKPCR-GR
```

amino terminal domain continued

```
                                                        TM1
                                              ◄┤━━━━━━━━━━━━━━━━━━━━┤
fz3/mouse    YSFLHVRDCSPPCPN------MYFRREELSFARYFIGLISIICLSATLFTFLTFLIDVTR
fz4/mouse    --LNCVLKCGYDAG-------LYSRSAKEFTDIWMAVWASLCFISTTFTVLTFLIDSSR
fz8/mouse    -KTGQIANCALPCHN------PFFSQDERAFTVFWIGLWSVLCFVSTFATVSTFLIDMER
fz5/human    -RTGQVPNCAVPCYQ------PSFSADERTFATFWIGLWSVLCFISTSTTVATFLIDMDT
fzd9/human   --RSCAPRCGPGVEV-------FWSRRDKDFALVWMAVWSALCFFSTAFTVLTFLLEPHR
fzl/rat      LGEK---DCGAPCEPTKVYGLMYFGPEELRFSRTWIGIWSVLCCASTLFTVLTYLVDMRR
fz2/rat      LGER---DCAAPCEPARPDGSMFFSHHHTRFARLWILTWSVLCCASTFFTVTTSLVAMQR
fz/Dros      VGGKDLHDCGAPCH------AMFFPERERTVLRYWVGSWAAVCVASCLFTVLTFLIDSSR
fz2/Dros/    QRIAGVPNCGIPCKG------PFFSNDEKDFAGLWIALWSGLCFCSTLMTLTTFIIDTER
                 *                        :  : :*       :. *
```

```
                             TM2    ↦  extracellular domain loop 1
             ┤━━━━━━━━━━━━━━━━━━━━┤
fz3/mouse    FRYPERPIIFYAVCYMMVSLIFFIGFLLE-DRVACNASSP--------------------
fz4/mouse    FSYPERPIIFLSMCYNIYSIAYIVRLTVGRERISCDF----------------------
fz8/mouse    FKYPERPIIFLSACYLFVSVGYLVRLVAGHEKVACSGGAPGAGGRGGAGGAAAAGAGAAG
fz5/human    FRYPERPIIFLSACYLCVSLGFLVRLVVGHASVACS----------------------
fzd9/human   FQYPERPIIFLSMCYNVYSLAFLIRAVAGAQSVACD----------------------
fzl/rat      FSYPERPIIFLSGCYTAVAVAYIAGFLLE-DRVVCNDKFAE------------------
fz2/rat      FRYPERPIIFLSGCYTMVSVAYIAGFVLQ-ERVVCNERFSE------------------
fz/Dros      FRYPERAIVFLAVCYLVVGCAYVAGLGAG-DSVSCREPFPPPVK---LG----------
fz2/Dros/    FKYPERPIVFLSACYFMVAVGYLSRNFLQNEEIACDG----------------------
              * ****.:.*  . **     . :.
```

FIG. 2B

Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING
AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS
Inventors: Dennis A. Carson, et al.
Application No.: 09/847,102
Docket No.: 220002062900

4/16

```
                                                               TM3
                                        ⟵_____
fz3/mouse    --------------AQYKASTVTQGSHNK-ACTMLFMVLYFFTMAGSVWWVILTITWFLA
fz4/mouse    --------------EEAAEPVLIQEGLKNTGCAIIFLLMYFFGMASSIWWVILTLTWFLA
fz8/mouse    RGASSPGARGEYEELGAVEQHVRYETTGPALCTVVFLLVYFFGMASSIWWVILSLTWFLA
fz5/human    R---------------EHNHIHYETTGPALCTIVFLLVYFFGMASSIWWVILSLTWFLA
fzd9/human   --------------QEAGALYVIQEGLENTGCTLVFLLLYYFGMASSLWWVVLTLTWFLA
fzl/rat      ---------------DGARTVAQGTKKE-GCTILFMMLYFFSMASSIWWVILSLTWFLA
fz2/rat      ---------------DGYRTVGQGTKKE-GCTILFMMLYFFSMASSIWWVILSLTWFLA
fz/Dros      --------------RLQMMSTITQGHRQTTSCTVLFMALYFCCMAAFAWWSCLAFAWFLA
fz2/Dros/    ------------------LLLRESSTGPHSCTLVFLLTYFFGMASSIWWVILTFTWFLA
                           :        *  ::  :  :..  **  :::  ::*:


                                        TM4      ⟼   extracellular domain loop 2 ⟵
                             _____
fz3/mouse    AVPKWGSEAIEKKALLFHASAWGIPGTLTIILLAMNKIEGDNISGVCFVGLYDVDALRYF
fz4/mouse    AGLKWGHEAIEMHSSYFHIAAWAIPAVKTIVILIMRLVDADELTGLCYVGNQNLDALTGF
fz8/mouse    AGMKWGNEAIAGYSQYFHLAAWLVPSVKSIAVLALSSVDGDPVAGICYVGNQSLDNLRGF
fz5/human    AAMKWGNEAIAGYGQYFHLAAWLIPSVKSITALALSSVDGDPVAGICYVGNQNLNSLRRF
fzd9/human   AGKKWGHEAIEAHGSYFHMAAWGLPALKTIVILTLRKVAGDELTGLCYVASTDAAALTGF
fzl/rat      AGMKWGHEAIEANSQYFHLAAWAVPAIKTITILALGQVDGDVLSGVCFVGLNNVDALRGF
fz2/rat      AGMKWGHAAIEANSQYFHLAAWAVPAVKTITILAMGQIDGDLLSGVCFVGLNRLDPLRGF
fz/Dros      AGLKWGHEAIENKSHLFHLVAWAVPALQTISVLALAKVEGDILSGVCFVGQLDTHSLGAF
fz2/Dros/    AGLKWGNEAITKHSQYFHLAAWLIPTVQSVAVLLLSAVDGDPILGICYVGNLNPDHLKTF
             : **. *:  .  **  **  *   .:  *  :  :  .: *.*..          *


                 TM5
             _____
fz3/mouse    VLAPLCLYVVVGVSLLLAGIISLNRVRIEIPLEKE-----NQDKLVKFMIRIGVFSILYL
fz4/mouse    VVAPLFTYLVIGTLFIAAGLVALFKIRSNLQK-DG----TKTDKLERLMVKIGVFSVLYT
fz8/mouse    VLAPLVIYLFIGTMFLLAGFVSLFRIRSVIKQQGGP---TKTHKLEKLMIRLGLFTVLYT
fz5/human    VLGPLVLYLLVGTLFLLAGFVSLFRIRSVIKQ-GG----TKTDKLEKLMIRIGIFTLLYT
fzd9/human   VLVPLSGYLVLGSSFLLTGFVALFHIRKIMKT-GG----TNTEKLEKLMVKIGVFSILYT
fzl/rat      VLAPLFVYLFIGTSFLLAGFVSLFRIRTIMKH-DG----TKTEKLEKLMVRIGVFSVLYT
fz2/rat      VLAPLFVYLFIGTSFLLAGFVSLFRIRTIMKH-DG----TKTEPLERLMVRIGVFSVLYT
fz/Dros      LILPLCIYLSIGALFLLAGFISLFRIRTVMKT-DG----KRTDKLERLMLRIGFFSGLFI
fz2/Dros/    VLAPLFVYLVIGTTFLMAGFVSLFRIRSVIKQQGGVGAGVKADKLEKLMIRIGIFSVLYT
             : *    : :*  :   . :*  ::   :           . : :: ::  *:  *:
```

FIG. 2C

5/16

```
                    TM6            extracellular domain loop 3
fz3/mouse    VPLLVVIGCYFYEQAYRGIWETTWIQERCREYHIPCPYQVTQMS-------RPDLILFLM
fz4/mouse    VPATCVIACYFYEISNWALFRYSADDS------------------------NMAVEML
fz8/mouse    VPAAVVVACLFYEQHNRPRWEATHNCPCLRDLQPDQARR------------PDYAVFML
fz5/human    VPASIVVACYLYEQHYRESWEAALTCACPGHDTGQPRAK------------PEYWVLML
fzd9/human   VPATCVIVCYVYERLNMDFWRLRATEQPCAAAAGPGGRRDCSLP----GGSVPTVAVFML
fzl/rat      VPATIVIACYFYEQAFRDQWERSWVAQSCKSYAIPCPHLQGGGGVPPHPPMSPDFTVFMI
fz2/rat      VPATIVIACYFYEQAFREHWERSWVSQHCKSLAIPCPAHYT-------PRTSPDFTVYMI
fz/Dros      LPAVGLLGCLFYEYYNFDEWMIQWHRDICKPFSIPCPAARAPGS----PEARPIFQIFMV
fz2/Dros/    VPATIVIGCYLYEAAYFEDWIKALACPCAQVK--GPGKK-----------PLYSVLML
                  *     : . . *                                       ::

                   TM7
fz3/mouse    KYLMALIVGIPSIFWVGSKKTCFEWASFFHGRRKKEIVNESRQVLQEPDFAQSLLRDPNT
fz4/mouse    KIFMSLLVGITSGMWIWSAKTLHTWQKCS-----------NRLVNSGKVK-----REKRG
fz8/mouse    KYFMCLVVGITSGVWVWSGKTLESWRALC-----------TRCCWASKGAAVGAGAGGSG
fz5/human    KYFMCLVVGITSGVWIWSGKTVESWRRFT-----------SRCCCRPR-------RGHK-
fzd9/human   KIFMSLVVGITSGVWVWSSKTFQTWQSLC-----------YRKIAAGRARA----KACRA
fzl/rat      KYLMTLIVGITSGFWIWSGKTLNSWRKFY-----------TRLTNSK--------QGETT
fz2/rat      KYLMTLIVGITSGFWIWSGKTLHSWRKFY-----------TRLTNSR--------HGETT
fz/Dros      KYLCSMLVGVTSSVWLYSSKTMVSWRNFV-----------ERLQGKEPRT-----RAQAY
fz2/Dros/    KYFMALAVGITSGVWIWSGKTLESWRRFW----------RRLLGAPDRTGANQALIKQR
               : :   :  *   : .*:  *  **   :
```

FIG. 2D

Sequence alignment of a portion of the aminoterminal extracellular region of human
Frizzled receptors

```
HFZ1     VGQNTSDKGT---PSLLPEFWTSNPQHGGGGHRG-------------------------------GFPGGAG----ASERGKFSCPR
HFZ2     VGQNHSEDGA-----PALLTTAPPPGLQPGAGGTPG------------------------------GPGGGGAPPRYATLEHPFHC
HFZ3     LVDLNLAG------EPTEGAPV-----------------------------------------AVQRDYG----------FWC
HFZ4     CMEGPGD----------EE--------------------------------------------VPLPHKTPI---------QP
HFZ5     CMDYNRSEATTAPPRPFPAKPTLPG------------PPGA-----------------PASGG-----ECPAGGPFV-------CKC
HFZ6     TFDPHTEF------LGPQKKTE------------------------------------------QVQRDIG----------FWC
HFZ7     VGQNTSDGSGGPGGGPTAYPTAPYLPDLPFTALPPG------------------------------ASDGRGRPAF------PFSC
HFZ8     CMDYNRTDLTTAAPSPPRRLPPPPP-GEQPPSGSGHGRPPGARPPHRGGGRGGGGGDAAAPPARGGGGGGGKARPPGGGAAP---CEPGCQC
HFZ9     CMEAPENA-TAGPAEPHKGLGMLPV--------------------------------------APRPARPPG--------DLGP
HFZ10    NYLCMEAPNN----GSDEPTRGSGLFPP---------------------------------------LFRPQRPHSAQ----EHP
```

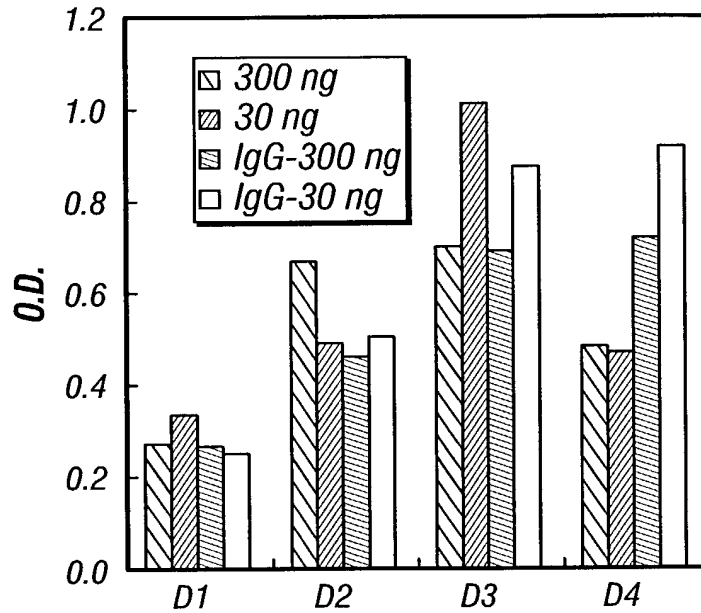**FIG. 3**

Effect of FZD on SNU1076 cells
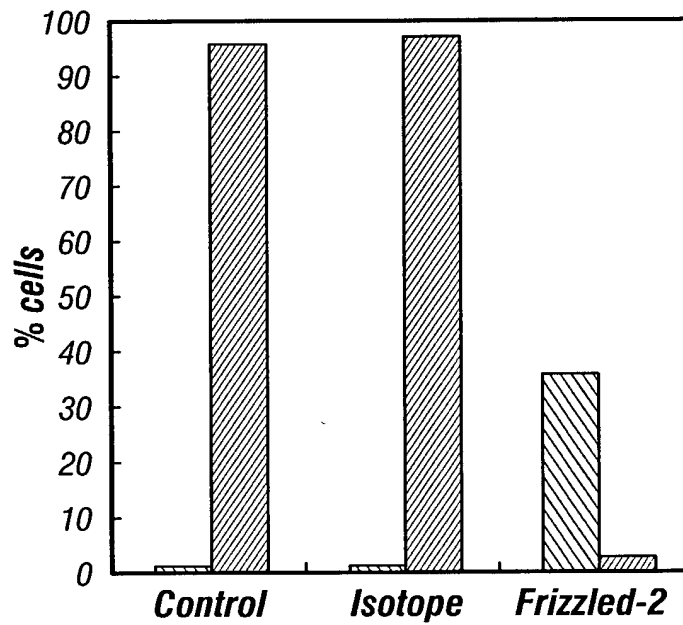

FIG. 4

Effect of antibodies SNU 1076 Cells

FIG. 5

Graphical Representation of an Olfactory Protein showing Aminoterminal and three Extracellular Domain Loops (from PCT WO 92/17585)
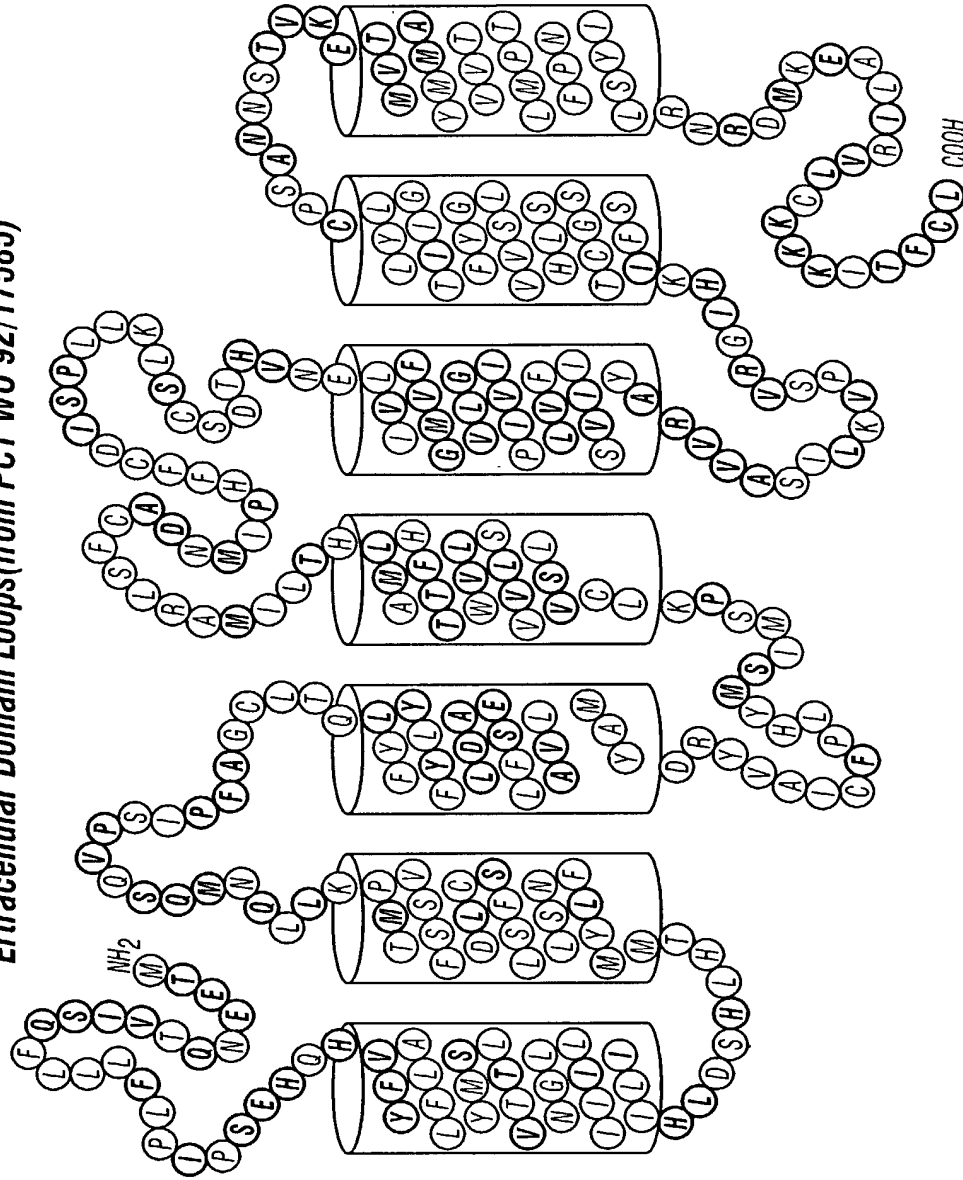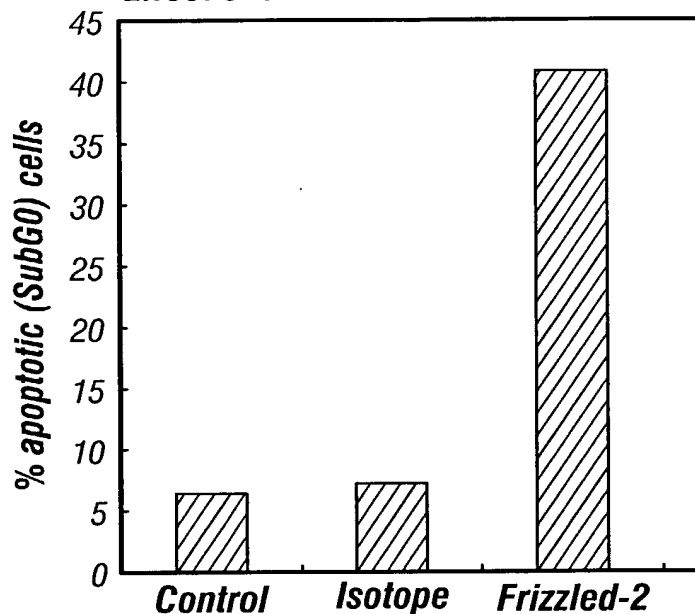
FIG. 7

Effect of antibodies SNU 1076 Cells

FIG. 6

↦   amino terminal domain

```
HFZ1    MAEEEAPKKSRAAGGGASWELCAGALSARLAEEGSGDAGGRRRPPVDPRRLARQLLLLLW
MFZ1    MAEEAAPSESRAAGR-LSLELCAEALPGRREEVGHEDTASHRRPRADPRRWASGLLLLLW
HFZ2    ------------------------------------------MRPRSALPRLLLPLL
HFZ3    ------------------------------------------MAMTWIVFSLWPLTV
MFZ3    ------------------------------------------MAVSWIVFDLWLLTV
HFZ4    ------------------------------------MAWRGAGPSVPGAPGGVGLSLGLLLQ
MFZ4    ------------------------------------MAWPGTGPSSRGAPGGVGLRLGLLLQ
HFZ5    ---------------------------------------MARPDPSAPPSLL--LLL
HFZ6    ------------------------------------------MEMFTFLLTCI
MFZ6    ------------------------------------------MERSPFLLACI
HFZ7    -----------------------------------MRDPGAAAPLSSLGLCALVLA
MFZ7    -----------------------------------MRGPGTAASHSPLGLCALVLA
HFZ8    -------------------------------------MEWGYLLEVTSLLAALAL
MFZ8    -------------------------------------MEWGYLLEVTSLLAALAV
HFZ9    ---------------------------------------MAVAPL-RGALLLWQLLA
MFZ9    ---------------------------------------MAVPPLLRGALLLWQLLA
HFZ10   -----------------------------------------MQRPGPRLWLVLQ
```

FIG. 8A

Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING
AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS
Inventors: Dennis A. Carson, et al.
Application No.: 09/847,102
Docket No.: 220002062900

9/16

```
HFZ1    LLEAPLLLGVRAQAAGQGPGQGPGPGQQPPPPPQQQQSGQQYNGERGISVPDHGYCQPIS
MFZ1    LLEAPLLLGVRAQAAGQVSG----PGQQAPPPPQPQQSGQQYNGERGISIPDHGYCQPIS
HFZ2    LLPA--------------A-----------------GPAQFHGEKGISIPDHGFCQPIS
HFZ3    FMGHI---------------------------------GGHSLFS--------CEPIT
MFZ3    FLGQI---------------------------------GGHSLFS--------CEPIT
HFZ4    LLLLLG-----------------------------PARGFGDEEE------RRCDPIR
MFZ4    FLLLLR-----------------------------PTLGFGDEEE------RRCDPIR
HFZ5    LAQLVG-----------------------------RAAAASKAPV--------CQEIT
HFZ6    FLPLL-------------------------------RGHSLFT--------CEPIT
MFZ6    LLPLV-------------------------------RGHSLFT--------CEPIT
HFZ7    LLGAL-------------------------SAGAGAQPYHGEKGISVPDHGFCQPIS
MFZ7    LLGAL-------------------------PTDTRAQPYHGEKGISVPDHGFCQPIS
HFZ8    LQRSSG------------------------------AAAASAKELA-------CQEIT
MFZ8    LQRSSG------------------------------AAAASAKELA-------CQEIT
HFZ9    AGGAAL-----------------------------EIGRFDPERGR---GAAPCQAVE
MFZ9    TGGAAL-----------------------------EIGRFDPERGR---GPAPCQAME
HFZ10   VMGSCA-----------------------------AISSMDMERP----GDGKCQPIE
                                                         *:  .


HFZ1    IPLCTDIAYNQTIMPNLLGHTNQEDAGLEVHQFYPLVKVQCSAELKFFLCSMYAPVCT-V
MFZ1    IPLCTDMAYNQTIMPNLLGHTNQEDAGLEVHQFYPLVKVQCSAELKFFLCSMYAPVCT-V
HFZ2    IPLCTDIAYNQTIMPNLLGHTNQEDAGLEVHQFYPLVKVQCSPELRFFLCSMYAPVCT-V
HFZ3    LRMCQDLPYNTTFMPNLLNHYDQQTAALAMEPFHPMVNLDCSRDFRPFLCALYAPICM-E
MFZ3    LRMCQDLPYNTTFMPNLLNHYDQQTAALAMEPFHPMVNLDCSRDFRPFLCALYAPICM-E
HFZ4    ISMCQNLGYNVTKMPNLVGHELQTDAELQLTTFTPLIQYGCSSQLQFFLCSVYVPMCTEK
MFZ4    IAMCQNLGYNVTKMPNLVGHELQTDAELQLTTFTPLIQYGCSSQLQFFLCSVYVPMCTEK
HFZ5    VPMCRGIGYNLTHMPNQFNHDTQDEAGLEVHQFWPLVEIQCSPDLRFFLCTMYTPICLPD
HFZ6    VPRCMKMAYNMTFFPNLMGHYDQSIAAVEMEHFLPLANLECSPNIETFLCKAFVPTCI-E
MFZ6    VPRCMKMTYNMTFFPNLMGHYDQGIAAVEMGHFLHLANLECSPNIEMFLCQAFIPTCT-E
HFZ7    IPLCTDIAYNQTILPNLLGHTNQEDAGLEVHQFYPLVKVQCSPELRFFLCSMYAPVCT-V
MFZ7    IPLCTDIAYNQTILPNLLGHTNQEDAGLEVHQFYPLVKVQCSPELRFFLCSMYAPVCT-V
HFZ8    VPLCKGIGYNYTYMPNQFNHDTQDEAGLEVHQFWPLVEIQCSPDLKFFLCSMYTPICLED
MFZ8    VPLCKGIGYNYTYMPNQFNHDTQDEAGLEVHQFWPLVEIQCSPDLKFFLCSMYTPICLED
HFZ9    IPMCRGIGYNLTRMPNLLGHTSQGEAAAELAEFAPLVQYGCHSHLRFFLCSLYAPMCTDQ
MFZ9    IPMCRGIGYNLTRMPNLLGHTSQGEAAAQLAEFSPLVQYGCHSHLRFFLCSLYAPMCTDQ
HFZ10   IPMCKDIGYNMTRMPNLMGHENQREAAIQLHEFAPLVEYGCHGHLRFFLCSLYAPMCTEQ
        :  * ::** *  :**  ..*  *  *   :  *  ::  *   .:. *** :* *
```

FIG. 8B

Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING
AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS
Inventors: Dennis A. Carson, et al.
Application No.: 09/847,102
Docket No.: 220002062900

10/16

```
HFZ1     LEQALPPCRSLCERARQGCEALMNKFGFQWPDTLKCEKFPVHG--AGELCVGQNTSDKGT
MFZ1     LEQALPPCRSLCERARQGCEALMNKFGFQWPDTLKCEKFPVHG--AGELCVGQNTSDKGT
HFZ2     LEQAIPPCRSICERARQGCEALMNKFGFQWPERLRCEHFPRHG--AEQICVGQNHSEDGA
HFZ3     YGRVTLPCRRLCQRAYSECSKLMEMFGVPWPEDMECSRFPDCD-EPYPRLVDLNLAG---
MFZ3     YGRVTLPCRRLCQRAYSECSKLMEMFGVPWPEDMECSRFPDCD-EPYPRLVDLNLVG---
HFZ4     INIPIGPCGGMCLSVKRRCEPVLKEFGFAWPESLNCSKFPPQN-DHNHMCMEGPGD----
MFZ4     INIPIGPCGGMCLSVKRRCEPVLREFGFAWPDTLNCSKFPPQN-DHNHMCMEGPGD----
HFZ5     YHKPLPPCRSVCERAKAGCSPLMRQYGFAWPERMSCDRLPVLGRDAEVLCMDYNRSEATT
HFZ6     QIHVVPPCRKLCEKVYSDCKKLIDTFGIRWPEELECDRLQYCD-ETVPVTFDPHTEF---
MFZ6     QIHVVLPCRKLCEKIVSDCKKLMDTFGIRWPEELECNRLPHCD-DTVPVTSHPHTEL---
HFZ7     LDQAIPPCRSLCERARQGCEALMNKFGFQWPERLRCENFPVHG--AGEICVGQNTSDGSG
MFZ7     LDQAIPPCRSLCERARQGCEALMNKFGFQWPERLRCENFPVHG--AGEICVGQNTSDGSG
HFZ8     YKKPLPPCRSVCERAKAGCAPLMRQYGFAWPDRMRCDRLPEQG-NPDTLCMDYNRTDLTT
MFZ8     YKKPLPPCRSVCERAKAGCAPLMRQYGFAWPDRMRCDRLPEQG-NPDTLCMDYNRTDLTT
HFZ9     VSTPIPACRPMCEQARLRCAPIMEQFNFGWPDSLDCARLPTRN-DPHALCMEAPENA-TA
MFZ9     VSTPIPACRPMCEQARLRCAPIMEQFNFGWPDSLDCARLPTRN-DPHALCMEAPENA-TA
HFZ10    VSTPIPACRVMCEQARLKCSPIMEQFNFKWPDSLDCRKLPNKN-DPNYLCMEAPNN----
              .*   :*      *  ::  :.. **: : *  .:   .


HFZ1     PT---PSLLPEFWTSNPQHGGGGHRG-----------------------------------
MFZ1     PT---PSLLPEFWTSNGQHGGGGYRG-----------------------------------
HFZ2     -----PALLTTAPPPGLQPGAGGTPG-----------------------------------
HFZ3     ---EPTEGAPV-------------------------------------------------A
MFZ3     ---DPTEGAPV-------------------------------------------------A
HFZ4     ------EE---------------------------------------------------V
MFZ4     ------EE---------------------------------------------------V
HFZ5     APPRPFPAKPTLPG------------PPGA-----------------PASGG-----
HFZ6     ---LGPQKKTE------------------------------------------------Q
MFZ6     ---SGPQKKSD------------------------------------------------Q
HFZ7     GPGGGPTAYPTAPYLPDLPFTALPPG-----------------------------------
MFZ7     GAGGSPTAYPTAPYLPDPPFTAMSP-----------------------------------
HFZ8     AAPSPPRRLPPPPP-GEQPPSGSGHGRPPGARPPHRGGGRGGGGGDAAAPPARGGGGGGGK
MFZ8     AAPSPPRRLPPPPPPGEQPPSGSGHSRPPGARPPHRGGSSRGSGDAAAAPPSRGG----K
HFZ9     GPAEPHKGLGMLPV---------------------------------------------A
MFZ9     GPTEPHKGLGMLPV---------------------------------------------A
HFZ10    GSDEPTRGSGLFPP---------------------------------------------L
```

FIG. 8C

Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS
Inventors: Dennis A. Carson, et al.
Application No.: 09/847,102
Docket No.: 220002062900

11/16

```
HFZ1    GFPGGAG----ASERGKFSCPRALKVPSYLNYHFLGEKDCGAPCEPTKVYGLMYFGPEEL
MFZ1    GYPGGAG----TVERGKFSCPRALRVPSYLNYHFLGEKDCGAPCEPTKVYGLMYFGPEEL
HFZ2    GPGGGGAPPRYATLEHPFHCPRVLKVPSYLSYKFLGERDCAAPCEPARPDGSMFFSQEET
HFZ3    VQRDYG----------FWCPRELKIDPDLGYSFLHVRDCSPPCP----NMYFR--REEL
MFZ3    VQRDYG----------FWCPRELKIDPDLGYSFLHVRDCSPPCP----NMYFR--REEL
HFZ4    PLPHKTPI----------QPGEECHSVGTNSDQYIWVKRSLNCVLKCGYDAGLY-SRSAK
MFZ4    PLPHKTPI----------QPGEECHSVGSNSDQYIWVKRSLNCVLKCGYDAGLY-SRSAK
HFZ5    ECPAGGPFV--------CKCREPFVPILKESHPLYNKVRTGQVPNCAVPCYOPSFSADER
HFZ6    VQRDIG----------FWCPRHLKTSGGQGYKFLGIDQCAPPCP----NMYFK--SDEL
MFZ6    VPRDIG----------FWCPKHLRTSGDQGYRFLGIEQCAPPCP----NMYFK--SDEL
HFZ7    ASDGRGRPAF------PFSCPRQLKVPPYLGYRFLGERDCGAPCEPGRANGLMYFKEEER
MFZ7    -SDGRGRLSF------PFSCPRQLKVPPYLGYRFLGERDCGAPCEPGRANGLMYFKEEER
HFZ8    ARPPGGGAAP---CEPGCQCRAPMVSVSSERHPLYNRVKTGQIANCALPCHNPFFSQDER
MFZ8    ARPPGGGAAP---CEPGCQCRAPMVSVSSERHPLYNRVKTGQIANCALPCHNPFFSQDER
HFZ9    PRPARPPG--------DLGPGAGGSGTCENPEKFQYVEKSRSCAPRCGPGVEVFWSRRDK
MFZ9    PRPARPPG--------DSAPGPGSGGTCDNPEKFQYVEKSRSCAPRCGPGVEVFWSRRDK
HFZ10   FRPQRPHSAQ----EHPLKDGGPGRGGCDNPGKFHHVEKSASCAPLCTPGVDVYWSREDK


                 ◄┘
HFZ1    RFSRTWIGIWSVLCCASTLFTVLTYLVDMRRFSYPERPIIFLSGCYTAVAVAYIAGFLLE
MFZ1    RFSRTWIGIWSVLCCASTLFTVLTYLVDMPRFSYPERPIISLSGCYTAVAVAYIAGFLLE
HFZ2    RFARLWILTWSVLCCASTFFTVTTYLVDMQRFRYPERPIIFLSGCYTMVSVAYIAGFVLQ
HFZ3    SFARYFIGLISIICLSATLFTFLTFLIDVTRFRYPERPIIFYAVCYMMVSLIFFIGFLLE
MFZ3    SFARYFIGLISIICLSATLFTFLTFLIDVTRFRYPERPIIFYAVCYMMVSLIFFIGFLLE
HFZ4    EFTDIWMAVWASLCFISTAFTVLTFLIDSSRFSYPERPIIFLSMCYNIYSIAYIVRLTVG
MFZ4    EFTDIWMAVWASLCFISTTFTVLTFLIDSSRFSYPERPIIFLSMCYNIYSIAYIVRLTVG
HFZ5    TFATFWIGLWSVLCFISTSTTVATFLIDMDTFRYPERPIIFLSACYLCVSLGFLVRLVVG
HFZ6    EFAKSFIGTVSIFCLCATLFTFLTFLIDVRRFRYPERPIIYYSVCYSIVSLMYFIGFLLG
MFZ6    DFAKSFIGIVSIFCLCATLFTFLTFLIDVRRFRYPERPIIYYSVCYSIVSLMYFVGFLLG
HFZ7    RFARLWVGVWSVLCCASTLFTVLTYLFDMRRFSYPERPIIFLSGCYFMVAVAHVAGFLLE
MFZ7    RFARLWVGVWSVLSCASTLFTVLTYLVDMRRFSYPERPIIFLSGCYFMVAVAHVAGFLLE
HFZ8    AFTVFWIGLWSVLCFVSTFATVSTFLIDMERFKYPERPIIFLSACYLFVSVGYLVRLVAG
MFZ8    AFTVFWIGLWSVLCFVSTFATVSTFLIDMERFKYPERPIIFLSACYLFVSVGYLVRLVAG
HFZ9    DFALVWMAVWSALCFFSTAFTVLTFLLEPHRFQYPERPIIFLSMCYNVYSLAFLIRAVAG
MFZ9    DFALVWMAVWSALCFFSTAFTVFTFLLEPHRFQYPERPIIFLSMCYNVYSLAFLIRAVAG
HFZ10   RFAVVWLAIWAVLCFFSSAFTVLTFLIDPARFRYPERPIIFLSMCYCVYSVGYLIRLFAG
        *:  ::   : :.   ::  *. *:*::   * ******* : **   :: ..
```

FIG. 8D

⤅ extracellular domain loop 1

```
HFZ1     DRVVCNDK------------------------------------FAEDGARTVAQGTKK
MFZ1     DRVVCNDK------------------------------------FAEDGARTVAQGTNK
HFZ2     ERVVCNER------------------------------------FSEDGYRTVVQGTKK
HFZ3     DRVACNAS---------------------------------I---PAQYKASTVTQGSHN
MFZ3     DRVACNAS---------------------------------S---PAQYKASTVTQGSHN
HFZ4     RERISCDF------------------------------------EEAAEPVLIQEGLKN
MFZ4     RERISCDF------------------------------------EEAAEPVLIQEGLKN
HFZ5     HASVACS--------------------------RE--------------HNHIHYETTGP
HFZ6     DSTACNKA-----------------------------------D---EKLELGDTVVLGSON
MFZ6     NSTACNKA-----------------------------------D---EKLELGDTVVLGSKN
HFZ7     DRAVCVER------------------------------------FSDDGYRTVAQGTKK
MFZ7     DRAVCVER------------------------------------FSDDGYRTVAQGTKK
HFZ8     HEKVACSGGAPGAGGAGGAGGAAA-GAGAAGAGAGGPGGRGEYEELGAVEQHVRYETTGP
MFZ8     HEKVACSGGAPGAGGRGGAGGAAAAGAGAAGRGASSPGARGEYEELGAVEQHVRYETTGP
HFZ9     AQSVACD-------------------------------------QEAGALYVIOEGLEN
MFZ9     AQSVACD-------------------------------------QEAGALYVIQEGLEN
HFZ10    AESIACD-------------------------------------RDSGQLYVIQEGLES
```

```
                  ⬸
HFZ1     EGCTILFMMLYFFSMASSIWWVILSLTWFLAAGMKWGHEAIEANSQYFHLAAWAVPAIKT
MFZ1     EGCTILFMMLYFFSMASSIWWVILSLTWFLAAGMKWGHEAIEANSQYFHLAAWAVPAIKT
HFZ2     EGCTILFMMLYFFSMASSIWWVILSLTWFLAAGMKWGHEAIEANSQYFHLAAWAVPAVKT
HFZ3     KACTMLFMILYFFTMAGSVWWVILTITWFLAAVPKWGSEAIEKKALLFHASAWGIPGTLT
MFZ3     KACTMLFMVLYFFTMAGSVWWVILTITWFLAAVPKWGSEAIEKKALLFHASAWGIPGTLT
HFZ4     TGCAIIFLLMYFFGMASSIWWVILTLTWFLAAGLKWGHEAIEMHSSYFHIAAWAIPAVKT
MFZ4     TGCAIIFLLMYFFGMASSIWWVILTLTWFLAAGLKWGHEAIEMHSSYFHIAAWAIPAVKT
HFZ5     ALCTIVFLLVYFFGMASSIWWVILSLTWFLAAAMKWGNEAIAGYGQYFHLAAWLIPSVKS
HFZ6     KACTVLFMLLYFFTMAGTVWWVILTITWFLAAGRKWSCEAIEQKAVWFHAVAWGTPGFLT
MFZ6     KACSVVFMFLYFFTMAGTVWWVILTITWFLAAGRKWSCEAIEQKAVWFHAVAWGAPGFLT
HFZ7     EGCTILFMVLYFFGMASSIWWVILSLTWFLAAGMKWGHEAIEANSQYFHLAAWAVPAVKT
MFZ7     EGCTILFMVLYFFGMASSIWWVILSLTWFLAAGMKWGHEAIEANSQYFHLAAWAVPAVKT
HFZ8     ALCTVVFLLVYFFGMASSIWWVILSLTWFLAAGMKWGNEAIAGYSQYFHLAAWLVPSVKS
MFZ8     ALCTVVFLLVYFFGMASSIWWVILSLTWFLAAGMKWGNEAIAGYSOYFHLAAWLVPSVKS
HFZ9     TGCTLVFLLLYYFGMASSLWWVVLTLTWFLAAGKKWGHEAIEAHGSYFHMAAWGLPALKT
MFZ9     TGCTLVFLLLYYFGMASSLWWVVLTLTWFLAAGKKWGHEAIEAHGSYFHMAAWGLPALKT
HFZ10    TGCTLVFLVLYYFGMASSLWWVVLTLTWFLAAGKKWGHEAIEANSSYFHLAAWAIPAVKT
         *::::*:.:.*:.* **..:.***.*::.:****** ** .*** . ** ** *. :
```

FIG. 8E

Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING
AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS
Inventors: Dennis A. Carson, et al.
Application No.: 09/847,102
Docket No.: 220002062900

13/16

↦ extracellular domain loop 2 ↤

```
HFZ1    ITILALGQVDGDVLSGVCFVGLNNVDALRGFVLAPLFVYLFIGTSFLLAGFVSLFRIRTI
MFZ1    ITILALGQVDGDVLSGVCFLGLNNVDALRGFVLAPLFVYLFIGTSFLLAGFVSLFRIRTI
HFZ2    ITILAMGQIDGDLLSGVCFVGLNSLDPLRGFVLAPLFVYLFIGTSFLLAGFVSLFRIRTI
HFZ3    IILLAMNKIEGDNISGVCFVGLYDVDALRYFVLAPLCLYVVVGVSLLLAGIISLNRVRIE
MFZ3    IILLAMNKIEGDNISGVCFVGLYDVDALRYFVLAPLCLYVVVGVSLLLAGIISLNRVRIE
HFZ4    IVILIMRLVDADELTGLCYVGNQNLDALTGFVVAPLFTYLVIGTLFIAAGLVALFKIRSN
MFZ4    IVILIMRLVDADELTGLCYVGNQNLDALTGFVVAPLFTYLVIGTLFIAAGLVALFKIRSN
HFZ5    ITALALSSVDGDPVAGICYVGNQNLNSLRRFVLGPLVLYLLVGTLFLLAGFVSLFRIRSV
HFZ6    VMLLAMNKVEGDNISGVCFVGLYDLDASRYFVLLPLCLCVFVGLSLLLAGIISLNHVRQV
MFZ6    VMLLAMNKVEGDNISGVCFVGLYDLDASRYFVLLPLCLCVFVGLSLLLAGIISLNHVRQV
HFZ7    ITILAMGQVDGDLLSGVCYVGLSSVDALRGFVLAPLFVYLFIGTSFLLAGFVSLFRIRTI
MFZ7    ITILAMGQVDGDLLSGVCYVGLSSVDALRGFVLAPLFVVLFIGTSFLLAGFVSLFRIRTI
HFZ8    IAVLALSSVDGDPVAGICYVGNQSLDNLRGFVLAPLVIYLFIGTMFLLAGFVSLFRIRSV
MFZ8    IAVLALSSVDGDPVAGICYVGNQSLDNLRGFVLAPLVIYLFIGTMFLLAGFVSLFRIRSV
HFZ9    IVILTLRKVAGDELTGLCYVASTDAAALTGFVLVPLSGYLVLGSSFLLTGFVALFHIRKI
MFZ9    IVVLTLRKVAGDELTGLCYVASMDPAALTGFVLVPLSCYLVLGTSFLLTGFVALFHIRKI
HFZ10   ILILVMRRVAGDELTGVCYVGSMDVNALTGFVLIPLACYLVIGTSFILSGFVALFHIRRV
        :  *  :  :  .*  ::*.*::.   .     **: **   :..*  :: :*:::* ::*
```

↦ extracellular domain loop 3

```
HFZ1    MKH--DGTKTEKLEKLMVRIGVFSVLYTVPATIVIACYFYEQAFRDQWERSWVAQSCKSY
MFZ1    MKH--DGTKTEKLEKLMVRIGVFSVLYTVPATIVIACYFYEQAFRDQWERSWVAQSCKSY
HFZ2    MKH--DGTKTEKLERLMVRIGVFSVLYTVPATIVIACYFYEQAFREHWERSWVSQHCKSL
HFZ3    IPL--EKENQDKLVKFMIRIGVFSILYLVPLLVVIGCYFYEQAYRGIWETTWIQERCREY
MFZ3    IPL--EKENQDKLVKFMIRIGVFSILYLVPLLVVIGCYFYEQAYRGIWETTWIQERCREY
HFZ4    LQK--DGTKTDKLERLMVKIGVFSVLYTVPATCVIACYFYEISNWALFRYSADDSNMAV-
MFZ4    LQK--DGTKTDKLERLMVKIGVFSVLYTVPATCVIACYFYEISNWALFRYSADDSNMAV-
HFZ5    IKQ--GGTKTDKLEKLMIRIGIFTLLYTVPASIVVACYLYEQHYRESWEAALTCACPGHD
HFZ6    IQH--DGRNQEKLKKFMIRIGVFSGLYLVPLVTLLGCYVYEQVNRITWEITWVSDHCRQY
MFZ6    IQH--DGRNQEKLKKFMIRIGVFSGLYLVPLVTLLGCYVYELVNRITWEMTWFSDHCHQY
HFZ7    MKH--DGTKTEKLEKLMVRIGVFSVLYTVPATIVLACYFYEQAFREHWERTWLLQTCKSY
MFZ7    MKH--DGTKTEKLEKLMVRIGVFSVLYTVPATIVLACYFYEQAFREHWERTWLLQTCKSY
HFZ8    IKQQDGPTKTHKLEKLMIRLGLFTVLYTVPAAVVVACLFYEQHNRPRWEATHNCPCLRDL
MFZ8    IKQQGGPTKTHKLEKLMIRLGLFTVLYTVPAAVVVACLFYEQHNRPRWEATHNCPCLRDL
HFZ9    MKT--GGTNTEKLEKLMVKIGVFSILYTVPATCVIVCYVYERLNMDFWRLRATEQPCAAA
MFZ9    MKT--GGTNTEKLEKLMVKIGVFSILYTVPATCVIVCYVYERLNMDFWRLRATEQPCTAA
HFZ10   MKT--GGENTDKLEKLMVRIGLFSVLYTVPATCVIACYFXEHLNMDYWKILAAQHKCKM-
        :       : .** ::*:::*:*: ** **  :: * . *      :.
```

FIG. 8F

Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING
AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS
Inventors: Dennis A. Carson, et al.
Application No.: 09/847,102
Docket No.: 220002062900

14/16

```
                              ↵
HFZ1     AIPCPHLQAGGGAPPHPPMSPDFTVFMIKYLMTLIVGITSGFWIWSGKTLNSWRKFYTRL
MFZ1     AIPCPHLQGGGGVPPHPPMSPDFTVFMIKYLMT---------------LNSWRKFYTRL
HFZ2     AIPCP-----AHYTPR--MSPDFTVYMIKYLMTLIVGITSGFWIWSGKTLHSWRKFYTRL
HFZ3     HIPCP-------YQVTQMSRPDLILFLMKYLMALIVGIPSVFWVGSKKTCFEWASFFHGR
MFZ3     HIPCP-------YQVTQMSRPDLILFLMKYLMALIVGIPSIFWVGSKKTCFEWASFFHGR
HFZ4     -----------------------EMLKIFMSLLVGITSGMWIWSAKTLHTWQ-KCSNR
MFZ4     -----------------------EMLKIFMSLLVGITSGMWIWSAKTLHTWQ-KCSNR
HFZ5     TGQPR----AK---------PEYWVLMLKYFMCLVVGITSGVWIWSGKTVESWRRFTSRC
HFZ6     HIPCP-------YQAKAKARPELALFMIKYLMTLIVGISAVFWVGSKKTCTEWAGFFKRN
MFZ6     RIPCP-------YQANPKARPELALFMIKYLMTLIVGISAVFWVGSKKTCTEWAGFFKRN
HZF7     AVPCP----PGHFPPM---SPDFTVFMIKYLMTMIVGITTGFWIWSGKTLQSWRRFYHRL
MFZ7     AVPCP----PRHFSPM---SPDFTVFMIKYLMTMIVGITTGFWIWSGKTLQSWRRFYHRL
HFZ8     QPDQA----RR---------PDYAVFMLKYFMCLVVGITSGVWVWSGKTLESWRSLCTRC
MFZ8     QPDQA----RR---------PDYAVFMLKYFMCLVVGITSGVWVWSGKTLESWRALCTRC
HFZ9     AGPGG----RRDCSLPGGSVPTVAVFMLKIFMSLVVGITSGVWVWSSKTFQTWQSLCYRK
MFZ9     TVPGG----RRDCSLPGGSVPTVAVFMLKIFMSLVVGITSGVWVWSSKTFQTWQSLCYRK
HFZ10    NNQTK----TLDC-LMAASIPAVEIFMVKIFMLLVVGITSGMWIWTSKTLQSWQQVCSRR
                              ::* :*                        *


HFZ1     TN--SKQGETTV------------------------------------------------
MFZ1     TN--SKQGETTV------------------------------------------------
HFZ2     TN--SRHGETTV------------------------------------------------
HFZ3     RKKEIVNESRQVLQEP------------DFAQSLLRDPNTPIIRKSRGTSTQGTSTHAS
MFZ3     RKKEIVNESRQVLQEP------------DFAQSLLRDPNTPIIRKSRGTSTQGTSTHAS
HFZ4     LVNSGKVKREKRGNGW------------------------VKPGKGSE---------
MFZ4     LVNSGKVKREKRGNGW------------------------VKPGKGNE---------
HFZ5     CC-RPRRGHKSGGA--------------------------MA--AG-D---------
HFZ6     RKRDPISESRRVLQESCEFFLKHNSKVKHKKKHYKPSSHKLKVISKSMGTSTGATANHGT
MFZ6     RKRDPISESRRVLQESCEFFLKHNSKVKHKKKHGAPGPHRLKVISKSMGTSTGATTNHGT
HFZ7     SH--SSKGETAV------------------------------------------------
MFZ7     SH--SSKGETAV------------------------------------------------
HFZ8     CW-ASKGAAVGGGAGA------------------------TAAGGGGGPGGGGGGGP
MFZ8     CW-ASKGAAVGAGAGG------------------------SGPGGSGP-------GP
HFZ9     IA--AGRARAKACRAP------------------------GSYGRGTHC---------
MFZ9     MA--AGRARAKACRTP------------------------GGYGRGTHC---------
HFZ10    LKKKSRRKPASVITSG------------------------GIYKKAQH---------
```

FIG. 8G

Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING
AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS
Inventors: Dennis A. Carson, et al.
Application No.: 09/847,102
Docket No.: 220002062900

15/16

```
HFZ1    ------------------------------------------------------------
MFZ1    ------------------------------------------------------------
HFZ2    --,---------------------------------------------------------
HFZ3    STQLAMVDDQRSKAGSIHSKVSSYHGSLHRSRDGRYTPCSYRG--MEERLPHGSMS-RLT
MFZ3    STQLAMVDDQRSKAGSVHSKVSSYHGSLHRSRDGRYTPCSYRG--MEERLPHGSMS-RLT
HFZ4    ------------------TVV---------------------------------------
MFZ4    ------------------TVV---------------------------------------
HFZ5    -------------YPEASAALTGRTGPPGPAATYHKQVSLSHV-----------------
HFZ6    SAVAITSHDYLGQETLTEIQTSPETSMREVKADGASTPRLREQDCGEPASPAASIS-RLS
MFZ6    SAMAIADHDYLGQETSTEVHTSPEASVKEGRADRANTPSAKDRDCGESAGPSSKLSGNRN
HFZ7    ------------------------------------------------------------
MFZ7    ------------------------------------------------------------
HFZ8    GGGGGPGGGGGGSLYSDVSTGLTWRSGTAS-SVSYPKQMPLSQV---------------
MFZ8    GGGGGHGGGGGGSLYSDVSTGLTWRSGTAS-SVSYPKQMPLSQV---------------
HFZ9    -----------H---YKAPTVVLHMTKTDPSLENPTHL---------------------
MFZ9    -----------H---YKAPTVVLHMTKTDPSLENPTHL---------------------
HFZ10   -----------------PQKT-HHGKYEIPAQSPTCV----------------------


HFZ1    ------------------------------------------------------------
MFZ1    ------------------------------------------------------------
HFZ2    ------------------------------------------------------------
HFZ3    DHSRHSSSHRLNEQSRHSSIRDLSNNPMTHITHGTSMNRVIEEDGTSA------------
MFZ3    DHSRHSSSHRLNEQSRHSSIRDLSNNPMTHITHGTSMNRVIEEDGTSA------------
HFZ4    ------------------------------------------------------------
MFZ4    ------------------------------------------------------------
HFZ5    ------------------------------------------------------------
HFZ6    GEQVDGKG--QAGSVSESARSEGRISPKSDITDTGLAQSNNLQVPSSSEPSSLKGSTSLL
MFZ6    GRESRAGGLKERSNGSEGAPSEGRVSPKSSVPETGLIDCSTSQAASSPEPTSLKGSTSLP
HFZ7    ------------------------------------------------------------
MFZ7    ------------------------------------------------------------
HFZ8    ------------------------------------------------------------
MFZ8    ------------------------------------------------------------
HFZ9    ------------------------------------------------------------
MFZ9    ------------------------------------------------------------
HFZ10   ------------------------------------------------------------
```

FIG. 8H

Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING
AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS
Inventors: Dennis A. Carson, et al.
Application No.: 09/847,102
Docket No.: 220002062900

16/16

HFZ1	-------------------
MFZ1	-------------------
HFZ2	-------------------
HFZ3	-------------------
MFZ3	-------------------
HFZ4	-------------------
MFZ4	-------------------
HFZ5	-------------------
HFZ6	VHPVSGVRKEQGGGCHSDT
MFZ6	VHSASRARKEQGAGSHSDA
HFZ7	-------------------
MFZ7	-------------------
HFZ8	-------------------
MFZ8	-------------------
HFZ9	-------------------

FIG. 8I